

which bears the aperture. When the polypide is withdrawn into the zoecium this tubular projection appears square to transversely quadrangular. When the polypide is extruded the tentacle sheath further extends the reach of the tentacles. The tentacles were found to consistently number 23 in sectioned material.

The new species is distinguished from *P. tubulosa* (Solander), 1786, by its short tubular processes and its tentacle number. In *P. tubulosa* the tentacle number is 28 (Prouho, 1892). It is distinguished from *P. flabellaris* (Kirkpatrick), 1890, which like Solander's species has lengthy tubular processes 0.6 mm in height, but has only 20 tentacles.

Holotype.—AHF no. 55. Colony incrusting upon the holdfast and blades of *Halidrys* sp.? (marine alga).

Type locality.—Hancock Foundation station 1909-49, east of Portuguese Bend, Calif., lat. 33° 43' 00" N., long. 118° 19' 57" W.; 8 to 7.5 fathoms; bottom rocky, November 6, 1949; collector, J. D. Soule.

Additional distribution.—(1) Santa Barbara-San Luis Obispo County line; washed ashore on holdfast of *Halidrys*; August 2, 1939; collector, A. Sorensen. (2) Punta Baja, near Rosario, Baja California, tide pool; substratum unknown; April 9, 1946; collector, E. Y. Dawson.

ZOOLOGY.—*The number of species of decapod and stomatopod Crustacea*.¹ FENNER A. CHACE, JR., U. S. National Museum.

As part of a collaborative effort to list the number of species belonging to each of the major groups of the Animal Kingdom for a proposed biological handbook, a fairly intensive survey was made of the Recent species of shrimps, lobsters, anomurans, crabs, and mantis shrimps. No such count of the decapod crustaceans seems to have been attempted in the past. It may be useful, therefore, to present the results of this survey in more complete form than they will appear in the handbook and to indicate the measures taken to insure a reasonably accurate coverage of the higher crustaceans.

The files on decapod and stomatopod crustaceans in the U. S. National Museum are unusually valuable for a survey of this

¹Published by permission of the Secretary of the Smithsonian Institution.

LITERATURE CITED

- BARROSO, M. G. *Notas sobre briozoos españoles*. Bol. Real Soc. Esp. Hist. Nat. 20: 353-362, 4 figs. 1920.
- KIRKPATRICK, R. *Report upon the Hydrozoa and Polyzoa collected by P. W. Bassett-Smith, Esq., Surgeon R. N., during the survey of the Tizard and Macclesfield Banks in the China Sea, by H.M.S. Rambler, Commander W. U. Moore*. Ann. Mag. Nat. Hist. (6) 5: 11-24, 3 pls. 1890.
- LAMOUREUX, J. V. F. *Histoire des polypiers coralligènes flexibles, vulgairement nommés zoophytes*: lxxiv + 559 pp., 19 pls. Caen, 1816.
- OKADA, Y. *Acyonidium* (Paralecyonidium) *vermiculare*, a new sub-genus and species of *ctenostomatous Bryozoa*. Ann. Zool. Japon. 10 (pt. 7, art. 28): 281-284, fig. 5, abc. 1925.
- PERVENS, E. *Contributions à l'histoire des bryozoaires et des hydroides récents*. Ann. Soc. Roy. Malacol. Belgique (Bull. Seances 1887) 22: lxxxvii. 1887.
- PROUHO, H. *Contribution à l'histoire bryozoaires*. Arch. Zool. Exp. (2) 10: 557-556, 8 pls. 1892.
- . *Some observations on Ascorchiza occidentalis Fewkes and related Aleyonidia*. Proc. California Acad. Sci. (zool. ser. 3) 3 (3): 99-108, pl. 14, figs. 1-9. 1902.
- SOLANDER, D. *Natural history of many curious and uncommon zoophytes, collected from various parts of the globe by the late John Ellis, systematically arranged and described by the late D. Solander*. London, 1783.
- THORNELEY, L. R. *Report on the Polyzoa collected by Prof. Herdman at Ceylon in 1902*. Rep. Pearl Oyster Fisheries Gulf of Manaar, suppl. rep. 26, Polyzoa, pt. 4. Royal Society, London, 1905.
- kind because of continued interest in the groups by one or more members of the staffs of the division of marine invertebrates for well over half a century. A systematic card catalogue expanded and amended from entries in the Zoological Record was used as the basis for the compilation. This was supplemented by reference to published generic revisions; to extensive unpublished notes and species lists which were initially accumulated by Dr. Mary J. Rathbun during her many years of active carcinological work and which have been continued and expanded by Dr. Waldo L. Schmitt; to an invaluable manuscript synonymy of the caridean shrimps compiled by Dr. L. B. Holthuis, of the Rijksmuseum van Natuurlijke Historie, Leiden, Holland; and to a manuscript summary of the crayfishes

of the world prepared by Dr. Horton H. Hobbs, Jr., of the Miller School of Biology, University of Virginia. Because of the lack of published revisions of a large proportion of the decapod genera, the results of this review would be very much less significant without the contributions of these four carcinologists.

As there is still a lag of several years between the appearance of scientific papers and their abstraction by the Zoological Record and as the disruption in the exchange of publications caused by the last world war has not yet been completely remedied, only those species described through the year 1945 have been counted. In general, only full species are included, although it must be admitted that a large number of crustacean subspecies and varieties will be elevated to specific rank when relationships become better known. It is of course impossible to arrive at definitive counts for most invertebrate groups. Differences of opinion as to the validity of many genera and species will persist until more complete collections are available for study and more workers have had an opportunity to review the evidence.

The classification in the following table follows the system accepted by most carcinologists today. There has been some criticism from workers in other groups of the use of the "tribe" as a superfamilial category. Justifiable though this criticism may be, it is felt that any change in the generally accepted classification of the Crustacea should await an over-all revision of that entire complex class. The subtribes and superfamilies have been intentionally omitted because of the lack of agreement about the limits of several of them and not because of any belief that they are not desirable for an understanding of decapod relationships.

NUMERICAL DISTRIBUTION OF THE RECENT
GENERA AND SPECIES OF DECAPOD
AND STOMATOPOD CRUSTACEA

	<i>Genera</i>	<i>Species</i>
ORDER DECAPODA	1,001	8,321
Suborder Natantia (shrimps)	211	1,930
Tribe Penaeidea	33	318
Family Penaeidae	27	231
Family Sergestidae	6	87

Genera Species

ORDER DECAPODA—Continued.		
Suborder Natantia (shrimps)—Continued.		
Tribe Caridea	171	1,590
Family Pasiphaeidae	7	60
Family Styliodactylidae	1	7
Family Atyidea	21	137
Family Opolophoridae	6	54
Family Nematocarcinidae	1	17
Family Bresiliidae	2	2
Family Disciadiidae	1	3
Family Processidae	2	15
Family Pandalidae	14	112
Family Thalassocaridae	1	2
Family Psalidopodidae	1	3
Family Crangonidae	20	399
Family Hippolytidae	28	200
Family Rhynehocinetidae	1	7
Family Campylonotidae	2	6
Family Palaemonidae	46	380
Family Gnathophyllidae	4	13
Family Glyphocrangonidae	1	35
Family Crangonidae	10	136
Family Eugonatonotidae	1	1
Family Physetocaridae	1	1
Tribe Stenopodidea	7	22
Family Stenopodidae	7	22
Suborder Reptantia	790	6,391
Tribe Palinura	16	123
Family Eryonidae	2	39
Family Palinuridae (spiny lobsters)	8	35
Family Scyllaridae (Spanish lobsters)	6	49
Tribe Astacura	25	313
Family Homaridae (lobsters)	7	32
Family Austroastacidae (crayfishes)	1	2
Family Parastacidae (crayfishes)	10	76
Family Astacidae (crayfishes)	7	203
Tribe Anomura	114	1,527
Family Aeglididae	1	20
Family Chirostylidae	3	69
Family Galatheidae	6	258
Family Porcellanidae	17	225
Family Axiidae	9	84
Family Axianassidae	1	2
Family Laomediidae	3	6
Family Callianassidae (mud shrimps)	6	160
Family Thalassinidae	1	5
Family Pylochelidae	5	17
Family Paguridae (hermit crabs)	38	555
Family Coenobitidae (hermit crabs)	2	17
Family Lithodidae (king crabs)	15	53
Family Albuneidae	4	31
Family Hippidae	3	25
Tribe Brachyura (true crabs)	635	4,428
Family Raninidae	10	30

	<i>Genera Species</i>	
ORDER DECAPODA—Continued.		
Suborder Reptantia—Continued.		
Family Homolodromiidae	4	6
Family Dromiidae	18	156
Family Dynomenidae	2	13
Family Thelxiopidae	6	16
Family Latreillidae	3	9
Family Hapalocarcinidae (coral gall crabs)	3	12
Family Dorippidae	10	77
Family Calappidae (box crabs)	10	65
Family Leucosiidae (purse crabs)	40	338
Family Euryalidae	6	14
Family Portunidae (swim- ming crabs)	38	297
Family Potamonidae (fresh- water crabs)	13	520
Family Ateleyclidae	13	30
Family Cancridae (rock crabs)	2	22
Family Xanthidae	133	928
Family Goneplacidae	54	170
Family Pinnotheridae (pea crabs)	26	222
Family Retroplumidae	1	4
Family Cymopoliidae	3	39
Family Grapsidae	40	333
Family Gecarcinidae (land crabs)	6	20
Family Ocypodidae (ghost crabs, fiddler crabs)	19	231
Family Hymenosomidae	9	53
Family Majidae (spider crabs)	145	673
Family Parthenopidae	21	150
Order Stomatopoda	8	178
Family Squillidae (mantis shrimps)	8	178

The total of approximately 8,321 recognized species of decapods agrees almost exactly with the estimate of "over 8,000 living species" cited by Pratt in 1935.² However,

² PRATT, H. S., *A manual of the common invertebrate animals exclusive of insects*, rev. ed.: 447-467. 1935.

the numbers of genera and species assigned by Pratt to several of the subordinal groups do not correspond as closely with the figures in the preceding table.

The Decapoda make up by far the largest order of the Crustacea; very nearly one-third of the accepted recent crustaceans belong to this group. It is likely that the number of species of decapods will increase by 30 or 40 percent when all living forms are recognized. Some of the other crustacean groups which have received attention for shorter periods of time possibly contain more undescribed species, but the position of the decapods as the largest and most diversified order of the class will probably never be seriously challenged.

It may be of interest that the number of decapods now known approximates Mayr's count of the number of full species of birds (8,616).³ The numbers of bird families (160) and genera (1,800-2,600), however, are fully twice as large as those of the decapods. The average genus of birds therefore contains only 3.3 to 4.75 species, whereas the average decapod genus is made up of 8.3 species. This discrepancy probably does not reflect any great dissimilarity between the specific relationships of birds and decapods. Because of the extreme diversification of the decapods, it would seem safe to assume that intense systematic attention to that group, similar to that which has been focused on birds for so long, would result in an even larger proportionate number of families and genera among the decapods than among the birds.

³ MAYR, ERNST, *The number of species of birds*. Auk 63: 64-99. 1946.